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CANNED and DRIED FRUITS on the LONDON MARKET

Comparative Appraisal of Selected Fruits From Selected Countries

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(For this report, information on production, packing, and marketing raisins in Australia and Turkey was supplied by British importers and members of the dried fruit trade from these countries. The authors have added this information because they felt it essential to proper evaluation of the results of their study.)

CANNED AND DRIED FRUITS ON THE LONDON MARKET

Comparative Appraisal of
Selected Fruits from Selected Countries

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INTRODUCTION

The Foreign Agricultural Service and the Agricultural Marketing Service made a study early in 1961 of canned and dried fruits on the London market, with two objectives in mind. The principal one was to compare the quality and condition of certain U.S. canned and dried fruits found in that market with similar products from competing countries. The other was to acquaint U.K. importers with U.S. grade standards and inspection procedures.

The London market was chosen for the study because a wide variety of processed foods arrives there from numerous countries. Also, while the United States historically has had a well-established market there for its canned and dried fruits, other countries now supply a large part of these products; and it was an objective of the study to show whether this loss of market was due to the quality of U.S. products compared to that of other areas or to factors beyond the control of U.S. processors.

The canned fruits studied were grapefruit sections, peaches, fruit cocktail, apricots, and pears. The dried fruits were raisins and prunes.

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SUMMARY

Sampling

In this study, samples were obtained from various points in the market flow with the objective of having as representative a sampling of each product as possible. For canned fruits, usually six cans, taken at random, were drawn from each lot of product. For dried fruits, usually six sample units of one retail-size package each or a pound or two of fruit taken from six or more containers in each lot made up the sample for that lot.

A total of 1,352 cans of fruit was graded, representing 220 separate lots. In addition, 390 sample units of raisins from 65 lots and 162 sample units of dried prunes from 27 lots were examined.

Standards and Grading

To facilitate comparison, U.S. grade-standards for the various products were used in determining the grades of the products, regardless of the country of origin. All grading was done in a well-equipped laboratory so that analyses could be made under conditions comparable with those under which grading is done in the United States.

Most products examined from all countries would be acceptable, grade for grade, on any market. In many instances, the best from one country was similar to the best from competing countries. Varietal differences, manufacturing practices, and possibly lack of skill and experience, however, caused some quality differences which were characteristic of certain producing areas. The quality of the products, however, exported to London in volume vary considerably from country to country.

Containers

Twenty-two different can sizes were encountered. Some were standard sizes in the United States; others varied only slightly from such sizes.

Nearly 17 percent of all cans examined were dented, some quite seriously. These ranged from about 4 percent

of the cans examined from Italy to 33 percent of those from Cyprus. By comparison, 11.5 percent of the cans from the United States were dented to a noticeable extent.

Canned Fruits

The principal differences in canned grapefruit samples examined appeared to stem from the method of peeling. Other minor differences were caused by the varietal types of fruit used. Canned grapefruit from the United States and Israel was very similar in appearance and flavor, even though Duncan seeded fruit was used principally in the United States and Marsh seedless in Israel. The knife-peeled Marsh-type fruit packed in the British West Indies resulted in a milder flavored, coarser grained product than that from the other two major areas. The British West Indies grapefruit sections tended to break easily when removed from the cans.

Most of the canned grapefruit examined was U.S. Grade B, regardless of its source, and 21 percent of the U.S. product was U.S. Grade A, as compared to 7 percent of that from both the British West Indies and Israel. Twenty-five percent of the canned grapefruit from the United States and 34 percent from Israel was Substandard, apparently caused partially by a combination of soft fruit and rough handling. A portion was old stock which had darkened in color.

Canned grapefruit from Israel was usually in heavier sirup than that from other countries. The drained weight of the British West Indies product averaged higher than that from competing countries.

Canned peaches from the principal competing countries, the United States, South Africa, and Australia, were very similar in general appearance. Almost all were yellow clingstones, either slices or halves. One noticeable difference, however, was the extensive use of the Kakamus variety in South Africa and to a lesser extent in Australia. Peaches of this variety have a high and even orange-red color which is much in demand in London.

Sixty-two percent of the cans of South African peaches examined were U.S. Grade A as compared to 37 percent of the U.S. product and 33 percent of that from Australia. Fifty-two percent of the cans of peaches from Australia were U.S. Grade B, 42 percent of those from the United

States and 31 percent of those from South Africa. Sixteen percent of the U.S. samples, 11 percent of those from Australia, and 4 percent of the cans from South Africa were U.S. Grade C. Five percent, or less, from each country were Substandard. Within each grade, the canned peaches from each country were of very similar quality. Those from South Africa and Australia usually were packed in higher density sirup than those from the United States.

The average drained weights of the canned peaches from all major producing countries equaled or exceeded those recommended in the United States grade-standards which were in effect at the time of the study. The average drained weights of the canned peaches from Australia and South Africa were higher, both for halves and slices, than those from the United States.

Canned fruit cocktail, a mixture of fruit ingredients consisting principally of diced peaches and pears, was found in some volume from the United States, Australia, South Africa, and England. Party because of U.S. quality and identity regulations, the U.S. product was highly standardized with respect to ingredients used and the proportion of each, the size of the fruit units, and the number of pieces of pineapple and cherry in each container. Canned fruit cocktail imported into London from other countries does not have to meet these requirements and usually does not do so.

Eighty-five percent of the cans of U.S. fruit cocktail were U.S. Grade A quality, compared to 40 percent of those from South Africa and from Australia, and 17 percent from England. The Brix (sweetness) of the sirup in the South African and Australian product was usually higher than that of the U.S. fruit cocktail.

Very few canned pears from the United States were found on the London market at the time of this study. Most of the pears available were from Australia, and 109 cans representing 17 lots were examined. No significant comparison of canned pears from competing countries is possible since only 4 lots of Italian pears were examined, 2 from South Africa, and 1 lot each from the United States, the Netherlands, and Argentina.

Seventy-nine percent of the Australian and Italian canned pears were U.S. Grade B, with most of the balance U.S. Grade C. The drained weight of the Australian pears was well above that recommended in the U.S. grade-standards which were in effect at the time of the study.

Canned apricots from the United States also were not found on the market in any volume at the time of the study. Significant comparisons, therefore, can be made only between the products of South Africa and Australia because of the very limited sampling from other areas.

Canned apricots from Australia and South Africa, all unpeeled halves, were similar in appearance and flavor to those usually packed in the United States. Of the 126 cans examined from South Africa, 11 percent were U.S. Grade A, 60 percent were U.S. Grade B, and 29 percent U.S. Grade C. For comparison, of the 60 cans from Australia, 5 percent were U.S. Grade A, 82 percent U.S. Grade B, and 13 percent U.S. Grade C. Within U.S. Grade B, the principal grade available, the average quality of the South African canned apricots (88.1 score points) was slightly higher than that of Australian apricots (85.5 score points). The average drained weights for both South African and Australian apricots in No. 2-1/2 cans were well above the minimum recommended in the U.S. Standards at the time of the study.

Dried Fruits

Almost all of the raisins on the London market at the time of the study were the seedless-type bleached Sultanas from Turkey and Australia, and sun-dried Thompson seedless from the United States. A few Lexias and Muscats (seeded raisins) were seen; however, the study concerned principally the seedless raisins since they compete substantially for the same markets.

Because of industry harvesting and packing practices, raisins from some areas arrive in London in only a partially processed stage. Thus, they are processed further there if necessary and priced accordingly. Raisins from Turkey normally require rewashing and sorting prior to use. Those from Australia are usually rewashed. Those from the United States usually come ready for eating or for use in the manufacture of bakery goods or confections.

Turkish raisins are government graded and sold on official certificates of grade. Those from Australia are graded before export but are sold on sample in London. U.S. raisins are usually sold on certificates of grade issued by the USDA or, occasionally, by the Dried Fruit Association of California.

Eleven of the 19 U.S. lots of raisins examined were U.S. Grade B, 7 were U.S. Grade C, and 1 lot contained excessive moisture. All 16 lots of Turkish raisins were Substandard, principally because of excessive stems, cap stems, and damage. All 28 lots of Australian Sultanas showed slight visible mold, usually a darkened area at the cap stem end of the raisin.

Most Australian and U.S. raisins were exceptionally free of cap stems but the Turkish raisins often had large numbers of them.

Many damaged raisins were found in the lots from Turkey--56 percent of them being Substandard for this reason--but most raisins from Australia and the United States were graded U.S. Grade A or B, and none was Substandard for this reason.

Ninety-five percent of the samples of raisins from the United States contained less than 1 percent showing any mold damage, and 94 percent of the Turkish raisins were within the 2 percent allowance for U.S. Grade A raisins. On the other hand, all Australian lots had raisins showing visible mold, ranging from 4.5 percent to more than 20 percent in a few instances.

All raisin samples were examined for sand and silt; none was objectionable in this respect. However, many from Australia and Turkey had been re-washed in the United Kingdom.

The raisins from Australia were unusually well matured. Fifty-four percent of the samples met U.S. Grade A requirements in this regard compared to 19 percent of those from Turkey, and 5 percent of the raisins from the United States. None of the Australian raisins was lower than U.S. Grade B with respect to maturity, whereas 6 percent of those from Turkey and 26 percent from the United States were U.S. Grade C for this reason.

Eighteen of the 27 lots of dried prunes encountered on the London market were from the United States, 3 were from Australia, 2 from Chile, and 4 from Argentina. Twelve of the U.S. lots were U.S. Grade A and 2 lots were Substandard. Sampling from the other countries was not large enough to provide any significant comparison.

Grading Demonstrations

During the course of the survey, effort was made to explain the use which is made of U.S. grade-standards, USDA quality inspection and official certificates of quality and condition in the production, financing, and marketing

of processed fruits and vegetables in the United States and how these marketing techniques might be extended advantageously to U.S. imports to the United Kingdom. Basic information brought out included (1) U.S. processed fruits are packed to specific, well defined, grades; (2) quotations and delivery may be made on any specified U.S. Grade; (3) U.S. grades are well known to U.S. packers and exporters; (4) U.S. certificates of grade and condition are readily available to shippers in the United States through the USDA Inspection Service, either on an in-plant or lot inspection basis; (5) these certificates have proved useful in the marketing of processed fruits and vegetables in the United States; and (6) the inclusion of U.S. grades in purchase contracts, with official U.S. grade certificates as evidence of compliance, would improve the marketing of these U.S. products on the London market.

PROCEDURE

Sampling

Samples were obtained at various points in the marketing flow, with the objective of having as representative a sampling of each product as it was possible to obtain within the time available for the survey. Sources were (1) direct from ships, (2) from goods stored in public warehouses, (3) from manufacturers' supplies, (4) from chain store warehouses, and (5) at retail, from supermarkets and large and small shops in all areas of the city. All samples were selected at random and were paid for.

The sample unit used for grading canned fruits was one can of fruit. The term "lot", as used here, refers to an amount of one kind of product available for sampling. Sometimes a lot was composed of only a few cans, most were less than 1,000 cases. Usually at least 6 cans were selected at random from each lot. On lots of 1,000 standard cases or more, 13 cans were drawn.

For dried fruits, the sample unit drawn for grading was a retail-size package or, in case of bulk pack, a pound or two of fruit from a large container. Sample units of dried fruit from a lot were mixed and a subsample of this mixture used for determining the grade of the lot from which the sample was drawn.

U. S. Standards Applied

For uniformity, U.S. standards for grades of the various products were used in determining the grade of each sample and each lot, regardless of the country of origin.

Grading

Considerable effort was expended in obtaining adequate space, lighting, and equipment so that the conditions under which products were graded would be comparable to those in USDA grading laboratories in the United States. Data concerning labels, condition of containers, weights, sirups, count of units, proportions of fruits, scoring of quality factors, and total score of grade and lot, where appropriate, were obtained in the same manner as if the grading were being done for an interested applicant in one of the grading laboratories in the United States. Where such information was appropriate, examination was made for extraneous materials, such as silt and sand, and for filth, such as mold.

Thus, most of the data presented here are based on the results of grading samples in accordance with U.S. standards for grades of the particular product. These grade standards describe the requirements for each grade and outline procedures for evaluating the various attributes of quality. For most products the standards provide a scoring system whereby a certain number of points may be assigned to represent a definite level of quality for each attribute, such as color, absence of defects, and sizing and character of fruit. Among other grade requirements is a minimum total score for the sample unit. "Score points," therefore, when presented in these data refer to definite levels of quality for the particular attribute in terms of U.S. grade standards.

A U.S. grade assigned to a can or other sample unit applies to that sample unit, subject, however, to certain published tolerances and limiting rules.

These tolerances take into consideration sample units which fall only slightly below the grade in some minor respects. For example, if 11 of 13 sample units meet U.S. Grade A requirements, two of these samples may be U.S. Grade B for very minor reasons and the lot be designated as U.S. Grade A.

Because of the importance of most quality factors, limiting rules have been adopted in the grades which

prevent giving of a higher grade than that indicated by the score of the particular factor being considered. For example, very poor brown color in canned grapefruit would prevent assigning a grade higher than Substandard regardless of the excellence of other factors or a high total score. For these reasons and because there may be many sample units of a higher grade in a lot, the grades and averages of the sample units shown in the tables in the Appendix often vary slightly from the grades and averages of the lots from which they were drawn.

The data shown in the tables in the Appendix include the net weight of each can, fruit and sirup, and the drained weight as determined by USDA procedures. Buyers are interested in the net weight because a declaration of the minimum net weight of product is a label requirement in many countries. The net weight of a certain size container is not an absolute guide to proper fill of fruit because it will vary considerably with the composition of the product. For example, the sirup surrounding a fruit may be more dense than the in-going fruit, in which case a can of sirup would weigh more than a can containing fruit and sirup. However, normal net weights for various can sizes, kinds, and styles of fruits, sirup densities, counts, and so forth, are recognized by buyers and are meaningful when all factors are considered.

Drained weight--the weight of fruit remaining on a screen after draining in accordance with USDA procedures--is an indicator of quality in canned grapefruit. In most other canned fruits, it is one indicator of fill of container. The reasons for a high or low drained weight of canned fruit are many and complex. Among the more important factors are: Quality and ripeness and variety of fruit, in-going weight of fruit, size of units, density of sirup, and time and temperature of cooking, cooling, and handling. Regardless of the causes, drained weights are indicators of value to buyers and users of canned fruit products. Too high drained weights might indicate little or no sirup, or very immature fruit. In general, however, the higher the drained weight the more desirable the product.

GENERAL OBSERVATIONS

Practically all of the products examined obviously had been packed under commercial manufacturing conditions. In many instances the best from one country

differed little from the best from other countries. For example, 100-point-score canned peaches were found in lots from all major producing areas. On the other hand, the use of unsuitable varieties of fruit in some areas and obvious lack of knowledge in others as to what was merchantable resulted in some very poor packs. One lot of canned pears, for example, appeared to have been prepared by hand peeling with little regard to the removal of worm holes. In a few instances, obviously Substandard products were found in retail-size cans bearing the names of reputable companies and with labels giving no indication of lower quality.

Can Sizes

Twenty-two different can sizes were encountered (Appendix, table 1). Some of them were standard sizes in the United States. Others varied only slightly in size or shape from a common U.S. can size. Size of cans is designated by giving the dimensions of the can in inches and approximate sixteenth inches, the diameter being given first and then the overall height. Thus a can designated as "314 x 405" is approximately 3-14/16 inches in diameter and 4-5/16 inches in height. Certain common-size cans are better known by the trade designation, No. 2-1/2, No. 2, No. 303, and so forth.

Condition of Containers

The problem of dented cans is a serious one in London. A large number, 16.7 percent of all samples examined, were dented a very noticeable extent, some quite seriously. The percent of dented cans, by country of origin, is as follows:

	Percent
Cyprus	33.3
Israel	26.2
South Africa	25.2
Australia	18.4
British West Indies	14.6
United States	11.5
Italy	4.2
England	0.0

The survey did not cover in detail the cause, extent, or type of damage. However, records were kept of all

significantly dented samples. The matter of dents came up almost every time canned foods were discussed. The survey team was shown numerous piles of dented cans which were discarded and other lots which were for sale at salvage prices. An executive of one large retail food chain said the store managers were instructed not to display any dented cans--they are returned to the vendor.

It was suggested repeatedly that the use of lighter gage steel in can-making was the principal cause. Others blamed poor case or can design. One particular type of damage which was very prevalent was a sharp bend in beaded cans at a side bead. In any event, most damage appeared to be caused by shock or by weight on the top of the cases. There was considerable evidence of very rough handling. It was pointed out that palletized shipments appeared to arrive in London in better shape than those handled without pallets. Palletized shipping is being tried on an experimental basis.

DETAILED COMMODITY ANALYSES

Canned Fruits

The British Market

While England produces many canned fruits, it imports most of what it uses, particularly the fruits covered by this study. Commercial fruit canning in large volume developed earlier in the United States than in competing areas, and Britain became a natural market for U.S. canned foods. Costs of delivery to London from the principal U.S. producing areas were not greatly different than to our own East Coast cities. At one time the United States supplied about 70 percent of the British market.

Because the United Kingdom was a premium market, American exporters catered to it, and U.S. canned foods enjoyed a reputation for superior quality. Prior to World War II, U.S. canned food was considered top quality. Much of it commanded premium prices. Seconds could be bought at a price, and Choice and Standard were well-defined grades. Canned fruits could be purchased by variety and count, as well as by other special requirements. Since the industry was so well developed in the United States, its products were used by British buyers

as "type samples" of what they wanted from other countries.

The canning industry in South Africa and Australia, the principal competitors with U.S. canned deciduous fruits, was still in its infancy at that time. With new plantings, better varieties and cultural practices, and advanced technology, however, the quality of these products began to approach that of the United States.

World War II greatly disrupted markets in the United Kingdom, and brought changes to the U.S. canning industry. During and after the war years, the industry adopted a high degree of automation and to some extent abandoned certain hand operations of grading for color, size, and shape. This was partly because of the shortage--and increasing cost--of labor. At the same time, advances in technology brought about many improvements in quality because of better, more suitable machinery and less dependence on the human element.

In certain other parts of the world, particularly in Australia, canning also became highly mechanized and for the same reasons as in the United States. South Africa, despite extensive mechanization, continues many hand operations because it still has an abundance of relatively cheap labor.

Authors grade canned fruit in their temporary lab. in London.

These changing market and manufacturing conditions have led to speculation as to whether the products the British market imports are as good as they used to be and whether there may not be substantial differences in the product supplied by different countries. This study was intended to provide answers to these conjectures so that future efforts to increase trade with the United Kingdom would be more effective.

During the study, 1,352 cans of fruit were graded, representing 220 separate lots and 80 different brands. U.S. grades were assigned both to containers and to the lots from which they were drawn.

Grapefruit Sections

Most samples came from the United States (Florida), the British West Indies (principally Jamaica), and Israel. A few came from Malta, Spain, and South Africa.

Some of the principal differences in the product from the various producing areas appeared to stem partly from the type of fruit used and partly from the method of peeling.

In lye-peeled grapefruit the fruit is given a quick dip in hot water or steam and the peel ripped off by hand or suitable machinery. A portion of the remaining rag, albedo or fiber covering the fruit is softened by a quick lye bath and removed by a water spray. When properly handled there is just enough fiber left on the outside of the fruit to hold it together while sectionizing and processing.

This method produces a characteristic type of section which usually holds its shape better than the sections from knife-peeled fruit.

Knife-peeling is accomplished by slicing the peeling off by repeated slices with a sharp knife until the entire outside of the fruit is free of rag and albedo. This also may weaken the section so there is considerable danger of breakage in sectionizing, processing, and removing from the can.

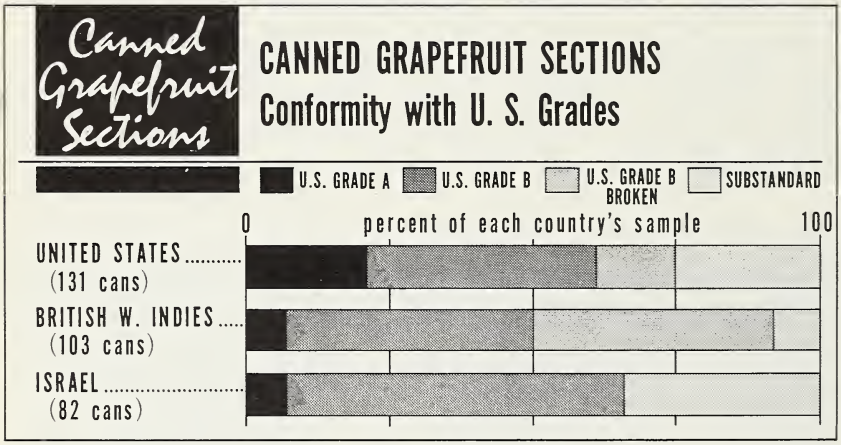
United States.--Canned grapefruit from the United States appeared to have been produced principally from medium-size Duncan or similar seeded grapefruit. All appeared to have been lye-peeled and most were of medium structure.

British West Indies.--Canned grapefruit from the British West Indies appeared to have been produced princi-

pally from Marsh-seedless-type grapefruit. Most of it was knife-peeled, much was of coarse structure and mild flavor. The principal reason for lowering the grade of this product in the present study was the tendency of the fruit to break apart when it was removed from the cans. Some lye-peeled fruit was much better in this respect.

Israel.--Canned grapefruit from Israel appeared to have been produced from medium-size Marsh-seedless-type fruit. It was usually of fairly fine structure, and was either lye-peeled or very carefully knife-peeled. The sections were usually fairly firm and of good flavor.

Other.--The few samples of canned South African grapefruit were produced from very small fruit. The



sections were firm and more bitter than grapefruit from most countries. This was true to a lesser extent in the very limited sampling of grapefruit from Malta and Spain.

The larger part of the cans of grapefruit from the principal producing countries was U.S. Grade B--40 percent of the U.S. product, 43 percent of the cans from the British West Indies, and 59 percent of those from Israel. Twenty-one percent of the U.S. product was U.S. Grade A as compared to 7 percent each from the British West Indies and Israel (Appendix, table 2).

Forty-two percent of the British West Indies samples were U.S. Grade B, Broken. Canned grapefruit of this grade is of good eating quality but contains many broken sections. This high percentage was principally caused by

deep knife-peeling. Twenty-five percent of the canned grapefruit from the United States and 34 percent from Israel graded Substandard. These unusually high percentages were caused principally by what appeared to be a combination of soft fruit and very rough handling. The segments were badly disintegrated. A portion was old stock which had deteriorated--principally dark colored.

In appearance and flavor the pack from Israel was very similar to that of the United States.

A complete analysis of each U.S. grade-standard used in this study is not given. However, the following, taken from the U.S. Standards for Grades of Canned Grapefruit, indicates principal factors of quality considered in determining the grade and the maximum number of score points that may be given such factors:

	Points
Drained weight	20
Wholeness	20
Color	20
Defects	20
Character	20
Total score	100

The minimum number of score points allowed for each grade is as follows:

	Points
U.S. Grade A	90
U.S. Grade B	80
U.S. Grade B, Broken	70

The total number of points scored by canned grapefruit from the major countries was quite high. In U.S. Grade B and U.S. Grade B, Broken--the principal trading grades--there was little difference between the quality of the products (Appendix, table 3). Canned grapefruit from Israel, however, averaged lower on the factors of Drained Weight, Color, and Defects than that from the United States or the British West Indies, but higher on Wholeness and Character. The product from the British West Indies had particularly low average scores on Wholeness and Character--partly because of the type of fruit used and partly because of the method of peeling.

The degrees Brix of canned grapefruit, while actually a measure of the density of the sirup, reflects principally the amount of sugar which has been added. The amount

of sugar added to citrus fruits is partly a matter of taste, although it is usually added in larger amounts to the higher acid, more bitter fruits in order to give them a desirable flavor balance. It is also partly a matter of economics--sugar being added rather freely where costs are low and duties not restrictive, as in South Africa. Of the canned grapefruit supplied by the major producing countries, that from Israel was several degrees sweeter and that from the British West Indies was slightly sweeter than the product from the United States (Appendix, table 4).

Measuring sweetness (Brix) of sirup from a can of fruit.

The No. 2 can was the only container found in any significant volume from more than one country. However, of this size none was found from the United States. The drained weights of canned grapefruit from the three major countries, the No. 2 can used in Israel and the British West Indies and the No. 303 size used in the United States were compared by giving the drained weights as a percentage of the capacity of the container as follows:

	Percent average drained weight is of capacity of container
British West Indies (#2 can) . . .	62.9
United States (#303 can)	59.3
Israel (#2 can)	57.0

While this method does not take into consideration the size and shape of the two containers, the comparison has some value when containers are similar in these respects. Canned grapefruit from the British West Indies shows a much higher average percentage of drained weight than that of the two major competitors.

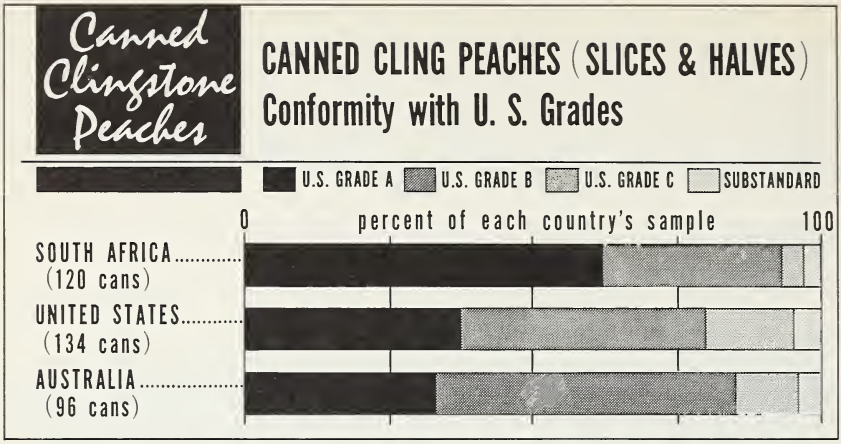
Peaches

Canned peaches examined were very similar from all major areas--the United States, South Africa, and Australia. Almost all were yellow Clingstones, either slices or halves. In general, peaches from the British Commonwealth countries were packed in higher density sirup than those from the United States. However, with the exception of the Kakamus variety, varieties of fruit, can sizes, and the types of machines used for peeling and pitting appeared to be practically the same in all areas.

The Kakamus variety accounts for about two-thirds of the Clingstone peaches grown in South Africa and a much smaller amount in Australia. It is a very popular canning peach and is in demand in London. Peaches of this variety are characterized by a high and even orange color and good, relatively firm texture. It is considered a midsummer variety.

The U.S. Standards for Grades of Canned Yellow Clingstone Peaches are based on a scoring system similar to that for canned grapefruit. As in other grades for canned products, the grade assigned to the can or lot is also dependent to some extent on the application of published tolerances and limiting rules, when appropriate. The following taken from the U.S. standards indicates the principal factors of quality which are considered in determining the grade and the maximum number of score points that may be given such factors:

	Points
Color	20
Uniformity of size and symmetry	20
Absence of defects	30
Character	30
Total score	100



The minimum number of score points allowed for each grade is as follows:

	Points
U.S. Grade A	90
U.S. Grade B	80
U.S. Grade C	70

In the present study, 62 percent of the canned peach samples from South Africa were U.S. Grade A, as compared to 37 percent of the samples of U.S. product and 33 percent of the canned peaches from Australia (Appendix, table 5). This was due principally to the use of the Kakamus variety. Peaches of this variety and of proper maturity score high on the factor of Color, both because of its pleasing red-orange hue and its uniformity. Texture also is usually very good. It was interesting to note that a large number of canned peaches of this variety were marketed under the label of a well-known U.S. food firm.

The percentage of U.S. Grade B product, as would be expected, was in the reverse order, with 52 percent of Australia, 42 percent of the United States, and 31 percent of South African peaches of this grade. Sixteen percent of the U.S. product, 11 percent of that of Australia, and 4 percent of the canned peaches from South Africa were U.S. Grade C. Five percent, or less, from each country were Substandard.

There was remarkable uniformity in the quality of the products within each grade, both for individual scoring factors and the total scores. The color of U.S. canned peaches was only slightly less desirable, principally be-

cause of lack of uniformity, than that of both South African and Australian canned peaches (Appendix, tables 6 and 7).

The average scores for the factor of Character in South African peaches were slightly lower than those of the competing countries. This was principally because of the use of a slightly firmer peach. There were no very significant differences in these data.

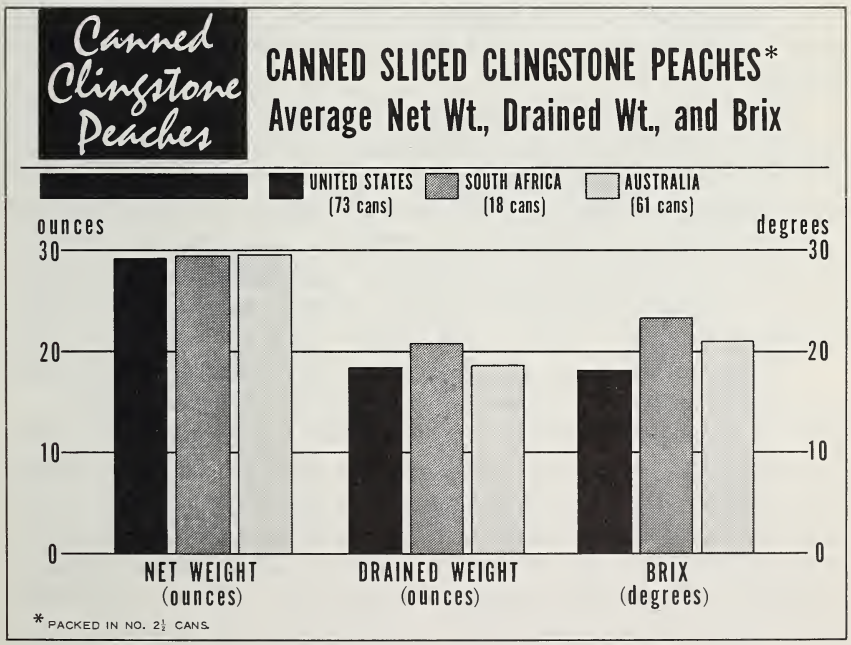
By container size, the Brix of the products of the competing countries was very uniform (Appendix, tables 8 and 9). Significant comparison of the net weights and drained weights is possible only in the popular No. 2-1/2 size can.

For canned sliced peaches the average drained weight of No. 2-1/2 cans were:

	Ounces
United States	18.4
Australia	18.7
South Africa	20.8

For canned halved peaches the average drained weights were:

	Ounces
United States	17.9
Australia	20.9
South Africa	20.9



These average drained weights for all countries equaled or exceeded the minimum average drained weights which were recommended in the U.S. grade-standards for this size can at the time of the study. These differences between countries could be due in part to the lower Brix (less sugar added) of the U.S. pack. Although the amount of sugar used is an economic factor, many U.S. packers contend that extra-heavy sirup is undersirable because it masks the flavor of the fruit.

Fruit Cocktail

In the United States, canned fruit cocktail to be labeled as such and move in interstate trade must meet certain requirements in regard to identity and quality. Among these are the kind and proportion by weight of each ingredient, the size and in some instances the number of units present, the drained weight, and a minimum level of quality. These requirements are enforced by the Food and Drug Administration of the U.S. Department of Health, Education, and Welfare. They are minimum standards below which the product is classified as Substandard.

The U.S. Standards for Grades of Canned Fruit Cocktail developed by the Department of Agriculture provide for two commercial levels of quality above Food and Drug Substandard. Compliance with all Federal Food and Drug requirements is a prerequisite for meeting these grades.

Most canned fruit cocktail examined was U.S. pack. Samples showed great uniformity with respect to ingredients used, proportions of ingredients, size of units, and drained weights. This is attributed partially to U.S. Food and Drug standards of identity. Certain U.S. packs, however, were obviously packed to specfications of mixed fruit on which the British fix a lower duty than for fruit cocktail.

Fruit cocktail (so labeled) from other countries lacked uniformity between packers, countries, and lots. Most, of course, was not packed to U.S. Food and Drug standards. The product, however, is similar to the fruit cocktail produced in the United States and competes for the same markets. Many lots were very good, some very poor. Some contained no grapes. The English pack usually contained Mandarin orange segments. Most countries used whole dyed cherries or dyed Maraschino cherries

instead of halved cherries. Often the fruits were chopped rather than diced or were diced in large cubes. Pineapple came in a variety of sizes and shapes, some very uniform; others of various sizes and shapes in the same can.

The U.S. Standards for Grades of Canned Fruit Cocktail, as with most canned fruits, are based on a scoring system. Grades are arrived at by considering the scores assigned to the various factors of quality, subject to published limiting rules and tolerances.

The factors of quality considered in grading canned fruit cocktail, the number of score points allowed for each such factor and the total scores required for each grade are as follows:

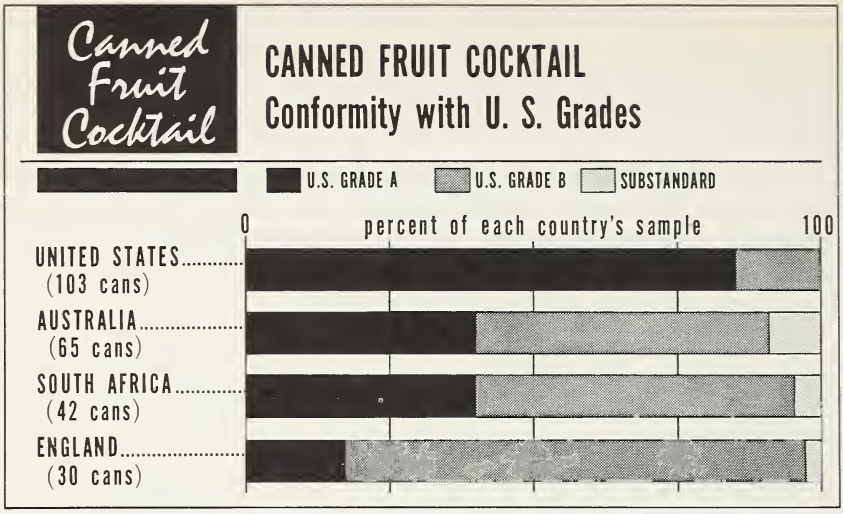
	Points
Clearness of liquid medium	20
Color	20
Uniformity of size	20
Absence of defects	20
Character	20
Total score	100

The minimum number of score points allowed for each grade is as follows:

	Points
U.S. Grade A	85
U.S. Grade B	70

For purposes of comparison only, the grades assigned to canned fruit cocktail in this survey were based on the quality of the product alone--composition and other similar Federal Food and Drug requirements were disregarded. This differs from the procedure followed in the United States, where no grade above Substandard may be assigned to a product which does not meet all Food and Drug requirements.

Of the cans of U.S. fruit cocktail studied, 85 percent were U.S. Grade A as compared to 40 percent from South Africa, 40 percent from Australia, and 17 percent from England. The number of Substandard cans from each country was negligible. Rather high percentages of cans, however, failed to comply with U.S. Food and Drug requirements. Twenty-three percent from the United States, 86 percent from South Africa, 91 percent of the Australian cans, and 100 percent of the English samples failed one



or more of these requirements (Appendix, table 10).

The reasons for failure to meet U.S. Food and Drug requirements varied from very poor quality to relatively minor deviations. Some are as follows:

United States:
One lot failed to meet required drained weight. Two lots failed because of too few cherries. One lot failed because of too high a percentage of peaches in the mix.

South Africa:
One lot failed minimum quality requirements because of poor color--badly stained and dulled from the dye used in the cherries.

Australia:
One lot graded Substandard because of poor color, principally a staining from artificial dyes used in the cherries. The lots that failed identity requirements did so for a variety of reasons, principally counts, sizes, and proportions of fruits present.

England:
Some lots were poorly colored and dulled because of staining from the dye used in the cherries. Most failed because of the ingredients used and the size and shape of the fruit units.

South African and Australian fruit cocktail averaged

several degrees higher in Brix than that from England and the United States. For comparisons, the average degrees Brix of the product from each competing country for all cans regardless of grade were:

	Degrees
South Africa	23.2
Australia	21.2
England	18.8
United States	18.8

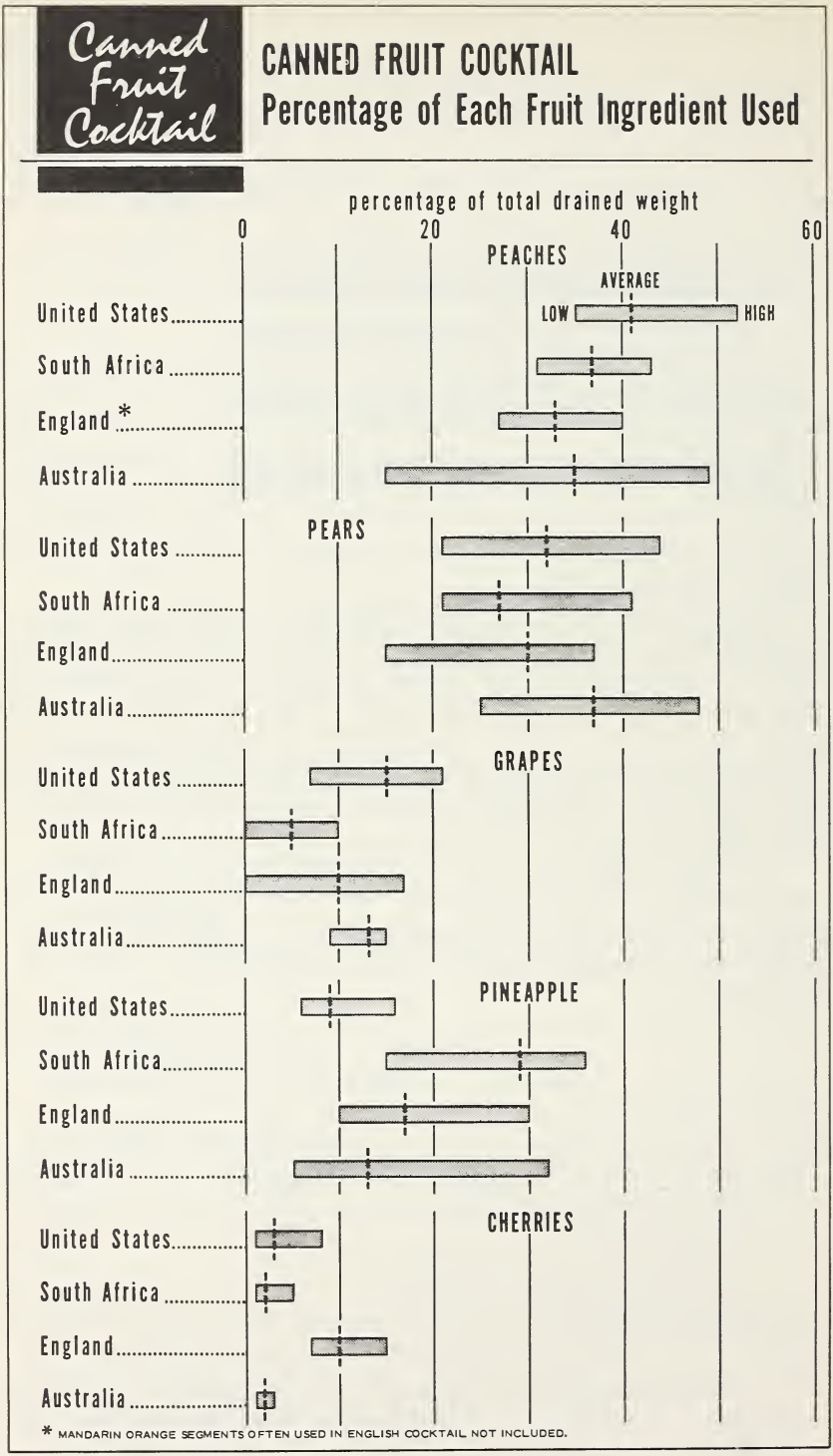
The samples from South Africa and England scored significantly higher on the factor of Clearness of Liquor than those from the United States and Australia. This is probably due to the firmness of the fruits used in these countries. The U.S. product scored significantly higher than competing products on the factor of Color. Otherwise, the fruit cocktail was of very similar quality within each grade (Appendix, table 11).

One of the U.S. requirements for canned fruit cocktail is that the drained weight of the product be not less than 65 percent of the water capacity of the container. This provides some assurance that the cans are properly filled with fruit. Where sampling was large enough to be significant, the product from all competing countries would meet the U.S. drained weight requirements (Appendix, table 12).

Another important U.S. Food and Drug Administration requirement for fruit cocktail concerns the kinds of fruits, styles of fruit, and the proportions of each that are permitted to be marketed as "Fruit Cocktail". These are as follows:

	Proportions of each fruit required (by weight of drained fruits)	
	Not less than	Not more than
	Percent	Percent
Diced yellow peaches	30	50
Diced pears	25	45
Seedless grapes, whole	6	20
Pineapple, diced or sectors	6	16
Cherry halves	2	6

A considerable variation is permitted in these percentages in order to properly use available fruits and to allow for normal variation between containers and between lots.


Canned Fruit Cocktail
CANNED FRUIT COCKTAIL
Percentage of Each Fruit Ingredient Used
percentage of total drained weight
0
20
40
60
PEACHES
AVERAGE
LOW
HIGH
United States
South Africa
England *
Australia
PEARS
United States
South Africa
England
Australia
GRAPES
United States
South Africa
England
Australia
PINEAPPLE
United States
South Africa
England
Australia
CHERRIES
United States
South Africa
England
Australia
* MANDARIN ORANGE SEGMENTS OFTEN USED IN ENGLISH COCKTAIL NOT INCLUDED.

The average percentages of fruit ingredients of fruit cocktail packed in the United States were well within the U.S. requirement (Appendix, table 13). The average percentages of peaches and pears in the cocktail from South Africa, Australia, and England were also within the U.S. requirement, but varied more between containers than the U.S. pack did. The principal variation between the pack of the various countries was in the percentages of grapes, pineapple, and cherries.

Grapes were often missing or were present in very small amounts in the South African and English packs. Pineapple varied considerably in all packs but was a major ingredient in the South African and to a lesser extent in the English and Australian packs. There was little uniformity in the size, shape, or color of the pineapple units in the South African pack. Dyed cherry halves were used only in the U.S. pack. Dyed whole cherries were used in the other packs except in a portion of the English fruit cocktail which contained whole natural cherries. Most of the English pack also contained a small amount of Mandarin orange segments.

Pears

Very few canned pears from the United States were found on the London market at the time of the study. Most of the pears available were packed in Australia--109 cans representing 17 lots were examined from that country. Four lots of Italian canned pears were sampled, two from South Africa, and one lot each from the United States, the Netherlands and Argentina. No significant comparison may be made between the quality of the products from competing countries since, with the exception of Australia, the sampling was not adequate, but some interesting data were collected on the characteristics of the canned pears found on the market.

The canned pears from Australia and South Africa were very similar, mostly fairly short- or medium-length necked and with moderately coarse grain. Those from Italy were long necked and had a fine grain and excellent flavor.

Modern American-type peeling and coring machinery appeared to have been used in most areas. Some pears were peeled lengthwise but most were peeled with rotary-type machinery. The lot from the United States was peeled with the curved-knife-type machine which shapes the pear. The one lot from the Netherlands appeared to have been

As part of inspection procedure, researcher weighs samples of canned fruit to get their net weights.

peeled by hand.

The U.S. Standards for Grades of Canned Pears are based on a scoring system. Score points for quality factors are considered in assigning the grade, subject to published tolerances and limiting rules.

The factors of quality and maximum score point assignable under the United States grade standards are:

	Points
Color	20
Uniformity of size and symmetry	20
Absence of defects	30
Character	30
Total score	100

The minimum number of score points allowed for each grade is as follows:

	Points
U.S. Grade A	90
U.S. Grade B	80
U.S. Grade C	70

In the present study, 79 percent of the cans of Australian and Italian pears were U.S. Grade B, with most of the balance U.S. Grade C (Appendix, table 14). The canned pears from Australia and Italy falling into Grade B were very similar in average score (Appendix, table 15).

The average drained weight of the 79 Australian samples of canned pears packed in No. 2-1/2 cans was 17.8 ounces--well above the minimums of 16 to 17 ounces (depending upon the number of halves per can) as recommended in the U.S. Standards for Grades of Canned Pears in effect at the time of the study (Appendix, table 16).

Apricots

At the time of the survey, canned apricots were available in volume only from Australia and South Africa. Two small lots each were found originating from the United States and Spain. While data on these lots are presented, significant comparison can be made only between the quality of 126 cans representing 21 lots of canned apricots from South Africa and 60 cans representing 10 lots from Australia.

Canned apricots from all producing countries were very similar with respect to varietal types and container sizes. All samples were of unpeeled halves.

In grading canned apricots in accordance with the U.S. grade-standards, the factors of quality taken into account and the maximum score points assignable to each are as follows:

	Points
Color	20
Uniformity of size and symmetry	20
Absence of defects	30
Character	30
Total score	100

The minimum number of score points allowed for each dessert grade is as follows:

	Points
U.S. Grade A	90
U.S. Grade B	80
U.S. Grade C	70

The grades assigned, as with other standards, are

based principally on this scoring system, subject to published limiting rules and tolerances.

Eighty-two percent of the cans of Australian apricots were U.S. Grade B, compared to 60 percent of those from South Africa. However, 11 percent of South African canned apricots were U.S. Grade A, compared to 5 percent from Australia. Twenty-nine percent of the cans from South Africa were U.S. Grade C, compared to 13 percent from Australia; none was Substandard (Appendix, table 17).

The two lots (12 cans) of U.S. apricots examined were U.S. Grade A. They were in extra heavy sirup, 26.4 degrees Brix, and were obviously packed as a very fancy product. The color and character scores averaged significantly higher than those of any other lot in the study (Appendix, table 18). Two U.S. Grade C lots from Spain were significantly lower in quality than any other lots. This was principally because of excessive defects.

Of the Grade B lots, the principal grade represented, the product from South Africa scored slightly higher on all factors than that from Australia. The total score for 78 cans of South African apricots averaged 88.1 points as compared to 85.5 points for the Australian product. The U.S. Grade C product from the two principal countries was very similar in all respects. There was only one-half score point difference in the averages of the total scores.

In the popular No. 2-1/2 and 300 x 409 can sizes, the canned apricots from South Africa and Australia were very similar in net and drained weights and in Brix. The minimum drained weight recommended for the No. 2-1/2 size can in the U.S. Standards for Grades of Canned Apricots at the time of this study was 17.5 ounces. The average drained weight of canned apricots from both of these countries exceeded this recommended minimum (Appendix, table 19).

Dried Fruits

In the study, 390 sample units of raisins from 65 lots were examined and 162 sample units of dried prunes from 27 lots. Many of these samples had had further cleaning, rehydrating, or other treatment in the United Kingdom. Thus, the samples discussed here are not entirely representative of the quality and condition of the lots on arrival, but the data presented are not without value. The samples, it is believed, represent quite well the quality and condition

of these products on the market at the time of the study.

Raisins

Popularly, on the London market, the term "raisin" is used only to refer to Lexia and Muscat seeded-type raisins. All seedless raisins, except "currants," are spoken of as Sultanas. For the purposes of this study, all dried grapes are referred to as raisins.

Production, harvesting, processing, packaging, and marketing practices for raisins in the various producing areas of the world differ considerably. As a result, raisins coming from the various areas are not always as directly competitive with each other as are more standardized products, such as canned peaches, which are much the same regardless of where they are packed. The London trade has come to accept raisins from each area for what they are, process them if necessary, and price them accordingly.

Australia.--The largest supplier of Sultanas and Lexias to the United Kingdom is Australia. The Lexia, a seeded raisin, was not encountered in any volume during this study. Most of the samples were of the Sultana, a practically seedless raisin of a size and shape similar to the Thompson seedless (Sultanina). As processed in Australia, it is light in color and for this reason is much in demand in England for use in bakery goods. It is also sold in retail-size containers, many of which are packaged in the United Kingdom.

The processing of grapes in Australia is different from that in the United States, in that the grapes are picked and are usually delivered to well-equipped drying yards where they are dipped for a few seconds in a hot solution containing potash and emulsive oil, or caustic. They are then dried on wire racks and, when dried, laid on cloth ground strips to prevent contamination.

The Commonwealth Dried Fruits Control Board regulates the quality of the raisins to be exported. Regulations of the Dried Fruit Boards of the various States govern the operations of drying yards and processing plants.

Each year the Commonwealth Dried Fruits Control Board establishes export grades based on the "fair average quality for the season." In establishing these grades, samples are assembled from all growing areas and selection is made to represent each grade, designated as

crowns, from one crown through 7 crowns. Samples representing each "crown" are sent to each producing area, to each processor, and to the Dried Fruits Board representatives in England. The two factors of color and size determine the crown number, the lighter color and larger fruit being given the higher numbers. One and two crown raisins are found only in poor crop years or when rain has damaged the crop.

All Australian raisins destined for the United Kingdom are sent on consignment. Purchases are made on the basis of samples drawn from the lots by government or private warehousemen. This procedure is deemed necessary by buyers because it is alleged that lots do not always comply with their crown designations or may vary considerably within the lot as to color and condition.

Australian raisins are usually re-washed or otherwise cleaned prior to repackaging for use in commercial outlets in the United Kingdom. Most samples examined during this study were free flowing.

Turkey.--The Turkish Sultana is very similar to the Australian Sultana in color and competes for the same markets.

The methods of production of raisins in Turkey are different from those employed in both Australia and the United States. Here, grapes for drying usually are dipped in caustic and placed on the ground. After drying, they are raked into piles and sacked for delivery to the processing plants. The fact that the grapes are dried on the ground presents processing problems since stones, clods, and trash may also be raked into the sacks. The Turkish Government has attempted to encourage the use of paper trays but without any great success.

In the processing plants the raisins are stemmed, cleaned, and treated with sulfur dioxide to bleach and preserve the fruit. At time of shipment they are washed, sorted, sprayed with mineral oil to keep them free flowing, and packed in corrugated fiberboard or wooden cases for shipment.

The Turkish Government has quite an elaborate set of standards for raisins. Each year, based on these standards, grade levels are set to represent "fair average quality for that season." They attempt to keep the same level from year to year unless there is some adversity in production. The levels are designated as "crowns" ranging from 6 crowns through 12 crowns. In general, the higher the number the better the color and the larger

and more uniform the size. Moisture, defects, and other factors, however, are also taken into consideration in assigning the crown. The majority of the crop is 8 crowns through 12 crowns. The Turkish grade also includes a stone tolerance. Each lot is inspected prior to exporting and an official grade certificate is written to cover the shipment. Trading is performed on these certificates; the Turkish Government does not allow any consignment shipments.

Color grading is considered quite uniform; however, lots vary considerably in regard to capstems, damage, and clumps of foreign material. This condition is recognized by the trade and is taken into consideration in establishing the use and price.

Turkish raisins are generally reprocessed in England prior to being used in the commercial or retail trade.

United States.--U.S. exports of raisins to the United Kingdom are largely controlled by the size of the crop (surplus tonnage) and by price. California Thompson seedless raisins are sun-dried on paper or wooden trays in the vineyards. They are then boxed and may be stored on the farm or delivered directly to processors.

By industry agreement under a Federal marketing order, each lot of raisins is inspected by the USDA for quality and must meet incoming inspection standards prior to processing. These require the quality to be such as to permit the packing out of at least a Standard product (U.S. Grade C). The raisins are then processed by stemming, sorting, cleaning, and washing.

After processing, each lot of raisins is again inspected by the USDA, as required by the Federal marketing order, to determine compliance with minimum standards for processed raisins. There are three market grades: U.S. Grade A, U.S. Grade B, and U.S. Grade C, the latter being the minimum grade permitted to be shipped. In addition to inspection for compliance with grade requirements, the raisins must not be contaminated by insects, dirt, rodents, or any other foreign material as evidenced by microscopic examination.

The principal objection heard concerning U.S. raisins is that they are not as free flowing as those from other areas. The addition of mineral oil for this purpose is not permitted under U.S. Food and Drug regulations.

Raisins from the United States usually are purchased "sight unseen" in the United Kingdom on the basis of certificates of quality and condition issued either by

Researcher makes microscopic examination of raisins, as part of the survey's inspection procedure.

USDA or the Dried Fruit Association of California.

The regular Thompson seedless, the principal type of raisin imported into the United Kingdom from the United States, is dark in color as compared to the Sultanas and Golden Bleach which are artificially bleached. Regular Thompson seedless raisins are used by confectioners for chocolate coating and to a certain extent by bakers. They also are sold in retail-size containers. Many firms repackage California raisins from bulk to retail-size packages in the United Kingdom.

California Golden Bleached raisins--produced in very small volume--are similar to the Australian and Turkish Sultanas and compete for the same markets. At the same price, it is believed they would be preferred by the London trade.

Other areas.--Raisins also are produced in volume in Near and Middle Eastern countries other than Turkey. However, samples of these raisins were not available in sufficient number for inclusion in the survey.

U.K. Import Restrictions.--Very few restrictions are placed on the import of dried fruits into the United Kingdom. Regulations prescribe allowable amounts of sulfur, antioxidants, mineral oil, and other similar additives. In addition, the Health Authority examines each lot of incoming dried fruit to determine if it is in good condition. Infested and out-of-condition lots normally are not condemned, but they may be detained until the owner can recondition them satisfactorily. In the case of insect infestation, dried fruits must be fumigated and reinspected before they are given clearance. As a result of many complaints, the British Government is doing some checking to see if actual net weights equal the declared weights.

Requirements of the U.S. Standards for Grades of Processed Raisins.--The U.S. grade-standards for raisins are not based on a numerical scoring system as is used for the canned fruits included in this study. It is, however, required that the product be prepared from clean, sound fruit properly sorted and cleaned to insure wholesomeness. A maximum moisture content is provided to assure proper keeping in storage. A good characteristic flavor is required for U.S. Grades A and B and at least a fairly good flavor in U.S. Grade C. The principal differences between the grades are the defects permitted and the maturity of the grapes as evidenced by the development characteristics of the raisins.

Analysis of Findings.--In sampling raisins, several (usually six) sub-samples were drawn at random from each lot of raisins examined. No more than one subsample was drawn from a single container or shipping case. All sub-samples for a lot were composited into a single sample on which a grade determination was made, regardless of the size of the lot.

Of the 19 lots of Thompson seedless raisins from the United States that were examined, 11 were U.S. Grade B; 7 U.S. Grade C; and 1 Substandard. Lack of maturity was the major reason most lots failed to make higher grades, although the one Substandard lot failed because of uneven moisture. This one lot was repackaged in England and moisture probably was added.

All 28 lots of Sultanas from Australia were Substandard due to visible mold. One lot of Lexias was Substandard because of capstems and another because of sugaring.

The 16 lots from Turkey were Substandard because

of stems, capstems, or damage.

Tables 21 through 26 in the Appendix show how the U.S. lots of raisins compared with lots from Australia and Turkey, each table being devoted to one of the principal grading factors or overall requirements which are considered in determining the U.S. grades of the lots examined.

For purposes of comparison, each of these tables relating to raisins also includes similar heretofore unpublished data, based on USDA inspections at time of packing, covering the entire U.S. Thompson seedless raisin crop for 1960.

Because the samples obtained during the survey were in all stages of dehydration and did not reflect the condition on arrival, comparisons of moisture content are of limited value. Nevertheless, most of the raisins were within the maximum of 18 percent moisture which is required by the U.S. grades above Substandard.

The removal of capstems, the tiny stems which attach the grapes to the bunch, is one of the important and difficult operations in the processing of raisins. Proper capstemming requires considerable care and depends principally upon good moisture control, good machinery, and proper maturity of the raisins. This operation appears

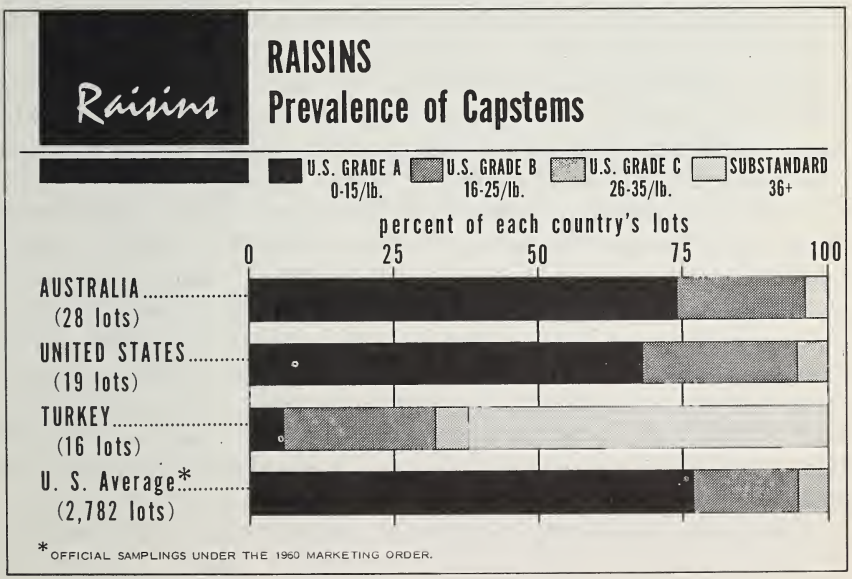
Examining raisin sample for defects.

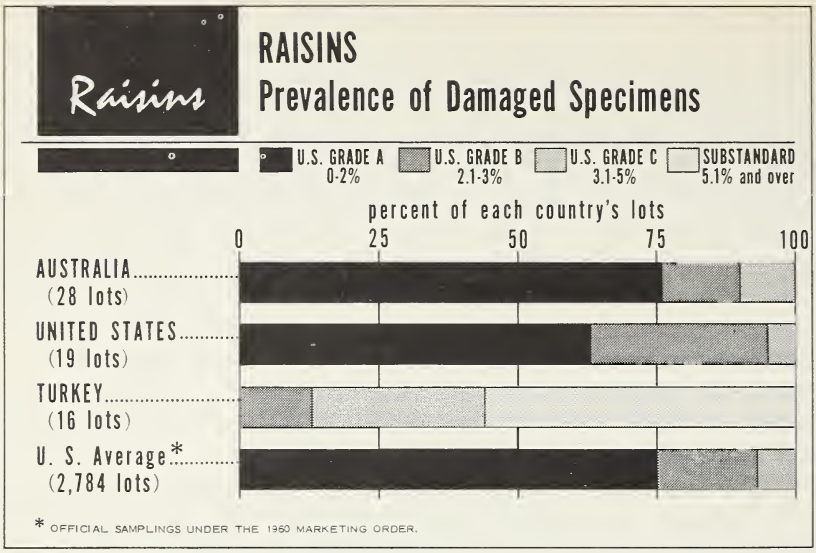
to be quite satisfactory in the United States, 68 percent of the lots meeting U.S. Grade A requirements for capstems, and in Australia where 74 percent of the lots examined met U.S. Grade A requirements in this respect. The capstemming operation in Turkey, however, appears to be quite different since 62 percent of the Turkish lots examined were classified as Substandard because of capstems. The U.S. raisins found in London were similar, as regards capstems, to the averages for the U.S. total pack.

Much more damage was found in Turkish raisins than in those from either the United States or Australia. Thirteen percent of the Turkish lots examined met U.S. Grade B requirements in this respect, 31 percent U.S. Grade C, and 56 percent were classified as Substandard because of damaged raisins.

Seventy-six percent of the Australian lots met the U.S. Grade A tolerance for damaged raisins compared to 63 percent of the lots from the United States. Thirty-two percent, however, of the U.S. lots met U.S. Grade B requirements for damage, while only 14 percent of those from Australia met this grade. Ten percent of the lots of Australian raisins met U.S. Grade C requirements for damage compared to 5 percent of those from the United States. The samples of U.S. raisins found in this survey were very similar, with respect to damage, to the entire U.S. pack for the 1960 season.

All U.S. lots were within the tolerance for mold in U.S. Grade A, 95 percent showing less than 1 percent mold

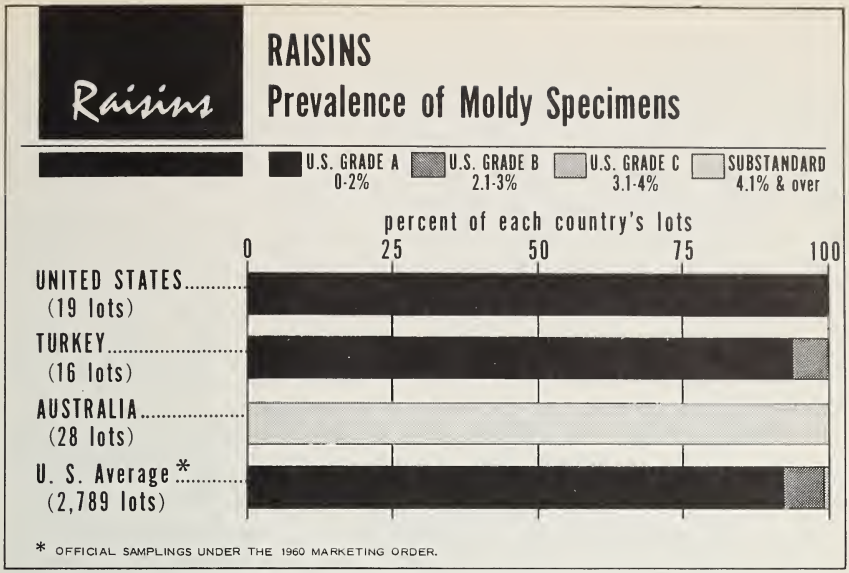




and 5 percent of the lots showing between 1 and 2 percent mold. The Turkish lots also showed little mold, with 94 percent meeting the requirements for U.S. Grade A. On the other hand, all Australian lots had over 4 percent mold--some in excess of 20 percent--and, consequently, were Substandard. The mold found in the Australian raisins usually was noticed as a darkened area at the point of attachment to the capstems.

Another of the factors considered in grading raisins is the presence of sand. A "unit" of sand is an amount of sand washed off a sample of raisins in accordance with an established inspection procedure. This procedure involves grinding and cooking a weighed sample, washing out the organic material, decanting most of the liquid away, and washing the reamining inorganic material into an especially designed tube which measures the volume of sand in arbitrary units. Less than 3 units of fine sand is considered to be only a trace and up to 7 units is not objectionable unless the sand is coarse. Sand was found to be more prevalent on Australian raisins than on those from Turkey or the United States. However, none of the raisins from any source were objectionable in this respect. These data, it should be remembered, are not representative of arrival quality since many lots of Turkish and Australian raisins had been rewashed in London before being marketed.

Grapes that have reached a proper stage of ripeness



before being picked produce high percentages of plump, sweet, and good-flavored raisins. In determining the U.S. grade of raisins, therefore, consideration is given to the percentages of such raisins in the lot. The higher the percentage of properly matured raisins, the better the quality.

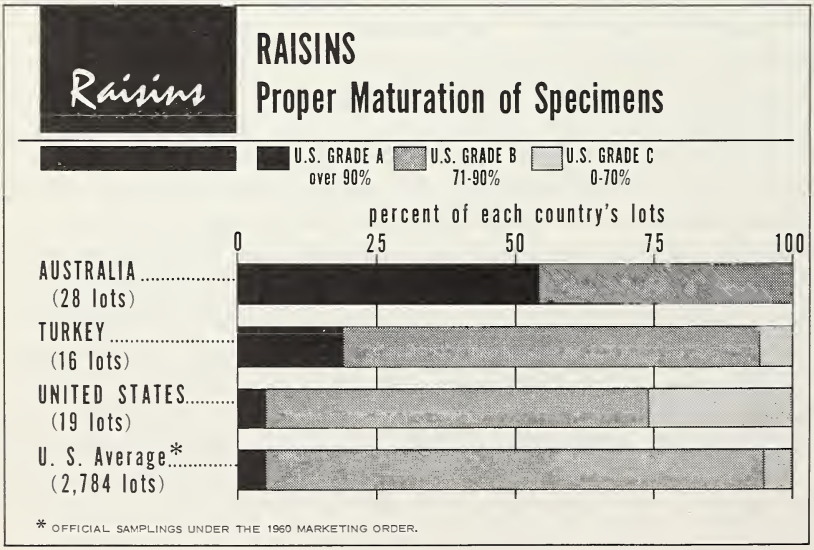
In the study, 54 percent of the samples of raisins from Australia met U.S. Grade A requirements for maturity compared to 19 percent of those from Turkey and 5 percent of the raisins from the United States. Forty-six percent of the lots from Australia, 75 percent from Turkey, and 69 percent from the United States were of U.S. Grade B maturity. None of the Australian raisins was of U.S. Grade C maturity, whereas 6 percent of those from Turkey and 26 percent from the United States fell into this category.

Possibly, grapes may be harvested at a more advanced state of maturity in Australia than in Turkey or the United States. The differences in percentages of properly matured raisins in lots from each of the three countries, however, may be due to other causes. These might include cultural practices, varietal differences (Thompson seedless in the United States and Sultana in the other countries), or seasonal differences, or more of the immature raisins may have been removed in the processing operation in Australia. The greater incidence of mold in the samples of Australian raisins would seem to indicate that mold may increase as the maturity of the grapes advances. This, however, may be due to the method of drying employed in Australia.

Production practices, growing conditions, harvesting, drying, storing, cleaning, rehydrating, and packing greatly affect the quality of dried prunes. The French or d'Agen type prune, the principal item of commerce and the only type encountered in this survey, is grown in areas where there is a fairly long growing season with a relatively cool climate and generally dry weather during harvest. Such areas are found in the coastal valleys of California, in Yugoslavia, France, Chile, Argentina, and other parts of the world. The United States produces the bulk of the world supply.

Under ideal conditions, the prune attains full maturity on the tree. When the sugar content has reached its maximum, the fruit drops to the ground of its own weight. If it is not damaged too badly by its fall, if the ground is not too wet or the sun too hot, and particularly if there are enough small breaks in the skin to allow the release of moisture, the prune will dry until the sugar concentration is sufficient to preserve it.

Good production practices attempt to create these ideal conditions and to minimize damage caused by adverse conditions. In the United States, before harvest, the ground is thoroughly broken, smoothed, and rolled so that each prune will fall into a cushion of dust rather than on weed stubs, sharp clods, or rocks--a major cause of damage. In some instances ground cloths are used.



Harvesting by mechanical means also is becoming increasingly important. Insect damage, wind storms, rain, and so forth, may cause the prunes to fall before the sugar content has reached maximum and result in poorly colored and low sugar, less plump prunes. In areas of too great heat, the trees are often shaken so that the prunes will drop and thus avoid sunburn damage. This also results in poorly colored, less plump prunes. Where the ground is too hot, a cooking and fermentation action may take place which damages the flesh by darkening it or causing gas pockets.

Soon after the prunes drop, they are picked from the ground into containers preparatory to drying. Originally, and under more primitive conditions, the prunes were dipped in a caustic solution to check the skin with small cracks in order to aid dehydration, placed in thin layers on wooden trays, and allowed to dry in the sun. In most of the major production areas, growers now deliver prunes to dehydrators where they are dried rapidly. This method gives the prunes good internal color and texture and minimizes the risk of damage due to adverse weather.

After dehydration, the prunes may be stored in boxes or bins either on the farm or in a packinghouse. During storage, damage may occur, principally from insects or rodents, if proper precautions are not taken. Mold and fermentation may occur if the prunes are not properly dried.

Usually just before shipping, the prunes are rehydrated to the desired level, washed, sorted for defects, sized, blended, and otherwise prepared and packaged. The care and thoroughness of these operations greatly affect the quality of the prunes as they appear on the market.

Requirements of the U.S. Standards for Grades of Dried Prunes.--The U.S. grade-standards for dried prunes do not include a numerical point scoring system such as is used for canned fruits. Nevertheless, the standards require that the dried prunes be prepared from sound, properly matured fruit, that they be cleaned to insure wholesomeness, and that the moisture content not exceed certain limits if the prunes are packed in nonhermetically sealed bulk containers.

The standards provide three grades above Substandard: U.S. Grade A, U.S. Grade B, and U.S. Grade C. The principal differences between these grades are the percents by weight of the various types of defects permitted. Color and texture also are considered. Only the larger

prunes (85 prunes or less per pound) are permitted in U.S. Grade A.

In sampling and grading lots of dried prunes for the survey, a composite sample was used for each lot, usually from six packages or more taken from different portions of the lot.

Most of the 27 lots of dried prunes examined originated in the United States. It is regretted that prunes from the other major producing areas of the world were either not available or not available in sufficient volume to provide meaningful comparisons with the U.S. product. Only 3 lots were available from Australia, 2 from Chile, and 4 from Argentina.

While most of the lots from the United States were U.S. Grade A, prunes of all grades and a wide range of sizes were available (Appendix, table 27). One lot was Substandard because of minor defects slightly in excess of allowances, another because of very uneven moisture content. Both U.S. Grade A and Substandard lots were seen from each of the other countries. The Substandard lots from Chile and Argentina had unusually large amounts of defective prunes.

Moisture content of all bulk pack lots from all countries was well within the maximum allowance. Moisture content is not a requirement of other than "bulk packs," where 24 percent is allowed for prunes averaging 61 or more per pound and 25 percent for prunes averaging 60 or less per pound.

Most retail-size packages were fiber cartons with wax paper or foil wraps. Some prunes were in transparent film bags, apparently repacked in the United Kingdom. Most of the U.S. bulk pack was in 25-pound corrugated fiberboard cases. The Australian pack was 35 pounds per case, that from Chile was marked "11.5 kgms." The prunes from Argentina were exceptionally well presented in 22-pound wooden cases which, when opened, revealed a "cello" top window and "cello" side curtains.

INDUSTRY CONTACTS AND GRADING DEMONSTRATIONS

In obtaining information on the market and marketing practices and in securing suitable samples for the study, personal calls were made to the places of business of a large number of people concerned with importing, selling, and distributing of processed foods. In line with the

objectives of the study, every effort was made to inform these people of the manner in which the use of U.S. grade-standards, USDA inspection, and official certificates assist in the production, financing, and marketing of processed fruits and vegetables in the United States. It was also explained how the techniques of packing to grade, official inspection, and certification might be extended advantageously to U.S. products imported into the United Kingdom.

All members of the industry in London who had shown any interest were invited to grading demonstrations which were conducted at the laboratory. At these demonstrations, three in number, the USDA procedures for developing grades and standards were discussed. Those attending were shown by demonstration how the official grade of the various products is determined. Basic information brought out at these meetings included--

(1) U.S. processed fruits are packed to specific, well-defined grades

(2) Quotations and delivery may be made on any specified U.S. grade

(3) U.S. grade-standards are well known to U.S. packers and exporters

(4) U.S. certificates of grade and condition are readily available to shippers in the United States through the USDA Inspection Service, either on an in-plant or lot inspection basis

(5) These certificates have proved useful in the marketing of processed fruits and vegetables in the United States

(6) The inclusion of U.S. grades in purchase contracts, with official U.S. grade certificates as evidence of compliance, would improve the marketing of U.S. products on the London market.

CONCLUSIONS

1. Importers for the London market are particularly concerned about the quality of canned and dried fruits. Desserts featuring canned fruits are much in evidence in good restaurants and hotels. For these products, color, form, freedom from defects, and character of fruit are very important.

2. The best of the canned fruits studied from any country were usually indistinguishable from the best from the other countries. Competition, therefore, is not based on what can be produced but on the quality and the price of the product that is exported.

3. U.S. packers should be concerned about proper fill of container. Complaints were heard often about low drained weights of canned fruits and short weight of dried fruits.

4. Dented cans are a serious problem in London. Buyers and storekeepers seem more concerned about dents than is common in the United States. Every reasonable effort should be made by packers, shippers, carriers, case and container makers, and warehousemen to minimize this problem.

5. Odd container sizes caused confusion among buyers about pricing. The No. #303 (303 x 406) apparently is used mostly in the United States. The competitive can used in South Africa and Australia is approximately 300 x 409, which is about the same capacity. Another competitive container is approximately 307 x 307. The appearance of the fruit in this container was particularly good and it was remarkably free from dents. Any possible standardization of containers between countries would be helpful.

6. Studies should be made to determine preferences of consumers in the various export markets for various levels of sweetness in canned fruits. U.S. products, grade for grade, on the London market usually were not as sweet as fruits from competing countries.

7. Efforts should be directed toward the production of slightly firmer canned grapefruit sections. Sections from soft fruit apparently do not stand usual rough overseas handling without excessive breakage.

8. Peaches of highly colored varieties seem to be preferred in London. This should be considered in selecting fruit for canning for export and in long-time variety development work. The Kakamus variety was well thought of in London because of its high and even red-orange color and fairly firm texture.

9. Uniformity of the U.S. pack of canned fruit cock-

tail was outstanding. At the same price, it is believed this product would be much preferred over that produced in other areas.

10. Thompson seedless raisins from the United States have good acceptance on the London market because they are known to be clean and ready to eat. However, greater acceptance by the bakery trade of these darker, sun-dried raisins will require vigorous promotion since the use of bleached Sultanas is well established.

11. Efforts should be made to improve the maturity rating of U.S. raisins offered on the London market. This might be accomplished by harvesting at a later date or by removing more of the less well-developed berries from the pack.

12. Numerous complaints were heard from the bakery, confectionery, and repackaging trade that U.S. raisins were not satisfactorily free flowing. Sticky raisins are not desirable for these purposes. This problem has been solved in other countries by adding mineral oils--a practice not permitted in the United States. A solution should be developed for this problem.

APPENDIX

Table 1. — Sizes of cans found in survey, by product and country of origin[1]

Country	Grapefruit	Peaches	Pears	Apricots	Cocktail
United States	303 x 406 (#303) 211 x 304 (8Z T) 210 x 300 307 x 409 (#2)	401 x 411 (2-1/2)	#303	#303 8Z tall	#2-1/2; 303, 300 x 409 8Z tall
South Africa	300 x 409	#2-1/2 300 x 409 307 x 307 211 x 400	#2-1/2 300 x 400 307 x 307	#2-1/2 300 x 409 307 x 307	#2-1/2 300 x 409 307 x 307 300 x 507
Australia		#2-1/2 300 x 409		#2-1/2 300 x 409	300 x 409 307 x 307 210 x 300
Italy			303 300 x 409 314 x 412 211 x 400		
England		211 x 300 (8Z S)			300 x 409 210 x 300 300 x 315
Israel	8 Z short #2 300 x 306				
Spain	214 x 405			300 x 408	
Holland			215 x 407		
British West Indies	#2 211 x 500				
Japan		300 x 507			
Argentina		213 x 406	213 x 406		
Cyprus	211 x 500 300 x 408				

[1] Some variation noted in similar sizes. These dimensions therefore are only approximate.

Table 2. — Canned grapefruit sections: Percent meeting U. S. grades by country of origin

Country of origin	No. of cans	U. S. Grade A	U. S. Grade B	U. S. Grade B, Broken	Sub-Standard	Total
		Percent	*Percent*	*Percent*	*Percent*	*Percent*
United States	131	21	40	14	25	100
British West Indies	103	7	43	42	8	100
Israel	82	7	59	0	34	100
South Africa	18	11	45	0	44	100
Cyprus	18	0	45	0	55	100
Spain	6	0	0	0	100	100

Table 3. — Canned grapefruit: Average degrees Brix and score points for each factor of quality, by lot grade and country of origin

Lot grade and country of origin	No. of cans	Average degrees Brix	Average score points					
			Dr. Wt.	Wholeness	Color	Defects	Character	Total
U. S. Grade A lots:								
United States	6	18.0	20.0	19.5	20.0	19.7	19.5	98.7
U. S. Grade B lots:								
United States	54	18.0	19.4	17.5	18.9	19.0	17.2	92.0
South Africa	12	23.7	17.5	17.0	17.4	16.8	18.6	87.3
Israel	48	20.2	18.2	17.8	17.9	18.5	18.7	91.1
British West Indies	8	19.6	19.0	16.9	19.2	19.1	16.4	91.6
Cyprus	6	14.3	17.0	16.3	18.0	18.0	16.2	85.5
U. S. Grade B – broken lots:								
United States	29	18.1	19.8	16.0	18.1	19.1	16.4	89.2
British West Indies	73	17.8	19.8	15.4	18.8	19.1	16.5	89.8
Substandard lots:								
United States	42	17.3	18.3	16.1	19.7	18.9	16.1	88.5
South Africa	6	25.5	15.0	19.5	18.8	19.0	18.8	91.2
Israel	36	21.0	17.0	14.8	18.0	20.0	18.7	88.5
British West Indies	12	18.2	20.0	16.2	19.5	19.2	17.0	91.8
Cyprus	12	12.9	18.3	16.9	16.9	15.6	16.6	81.4
Spain	6	24.6	13.8	16.0	17.5	18.0	17.0	82.3

Table 4.— Canned grapefruit: Average net weights, drained weights, and Brix, by can size and country of origin

Can size and country of origin	Number of cans	Average weight		Average Brix
		Net	Drained	
No. 2:	*Ounces*	*Ounces*	*Ounces*	*Degrees*
British West Indies	97	20.3	12.9	19.0
Israel	54	21.1	11.7	21.0
South Africa	12	21.3	10.5	25.0
303:				
United States	108	16.8	10.0	17.5
300 x 409: approx.:				
South Africa	6	17.3	8.4	22.8
300 x 408:				
Cyprus	12	16.2	8.9	15.1
214 x 405:				
Spain	6	15.9	8.3	24.6
211 x 500:				
British West Indies	6	10.9	6.5	19.8
Cyprus	6	11.3	7.0	12.4
300 x 306:				
Israel	12	11.6	6.5	21.3
8Z Tall:				
United States	18	8.3	5.3	18.7
8Z Short:				
Israel	6	8.5	4.2	20.7

Table 5.— Canned Clingstone peaches, slices and halves: Percent meeting U. S. grades, by country of origin

Country of origin	Number of cans	U. S. Grade			Sub-standard	Total
		A	B	C		
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
United States	134	37	42	16	5	100
South Africa	120	62	31	4	3	100
Australia	96	33	52	11	4	100
Japan	6	100	0	0	0	100
England	6	0	0	0	100	100
Argentina	6	0	0	0	100	100

Table 6. -- Canned halved peaches: Average Brix and score for each factor of quality by lot grade and country of origin points

Lot grade and country of origin	Number of cans	Average degrees Brix	Average score points				
			Color	Size	Defects	Character	Total
U. S. grade A lots:							
United States	18	24.7	18.8	18.6	29.0	28.2	94.6
South Africa.....	30	24.4	19.2	19.5	28.2	27.7	93.5
Australia	6	19.1	19.5	18.7	28.0	29.2	95.3
U. S. grade B lots:							
United States	19	20.8	17.2	17.3	27.7	26.7	88.9
South Africa.....	36	24.6	18.4	17.7	27.6	26.7	90.4
Australia	11	21.8	17.5	17.4	27.7	25.5	88.1
U. S. grade C lots:							
South Africa.....	6	22.7	17.0	18.8	26.7	25.5	88.0
Australia	6	18.6	15.0	16.7	26.7	23.5	81.8
Substandard lots:							
South Africa.....	6	25.6	12.7	13.2	25.2	19.0	72.7
Australia	6	23.3	13.7	13.8	19.5	18.5	65.5

Table 7. -- Canned sliced peaches: Average Brix and score points for each factor of quality by lot grade and country of origin

Lot grade and country of origin	Number of cans	Average degrees Brix	Average score points				
			Color	Size	Defects	Character	Total
U. S. grade A lots:							
United States	12	20.3	18.7	19.5	28.8	28.6	95.6
South Africa.....	30	23.4	19.3	19.3	29.2	28.0	95.8
Australia	12	23.6	19.2	19.8	28.8	28.8	96.6
U. S. grade B lots:							
United States	48	19.7	16.8	17.1	27.3	26.3	87.3
South Africa.....	12	24.1	17.8	17.8	27.5	25.8	89.0
Australia	36	21.3	16.9	17.5	27.8	26.4	88.6
U. S. grade C lots:							
United States	31	16.2	15.4	15.8	26.2	24.2	81.6
Australia	19	18.8	17.3	16.8	24.9	25.3	84.2
Substandard lots:							
United States	6	16.0	13.3	7.0	10.8	10.0	41.2
England.....	6	20.4	13.2	13.5	23.7	18.7	69.0
Argentina.....	6	18.2	14.8	9.7	24.2	19.3	68.0

Table 8. — Canned sliced Clingstone peaches: Average net weights, drained weights, and Brix by can size and country of origin

Can size and country of origin	Number of cans	Average weight		Average Brix
		Net	Drained	
#2-1/2:		*Ounces*	*Ounces*	*Degrees*
United States.....	73	29.2	18.4	18.2
South Africa.....	18	29.4	20.8	23.3
Australia.....	61	29.5	18.7	21.0
#303:				
United States.....	6	16.4	9.9	19.1
303 x 409:				
South Africa.....	12	16.5	11.5	24.2
Australia	6	16.5	9.2	21.5
307 x 307:				
South Africa:.....	12	16.0	10.0	23.4
8Z Short:				
England.....	6	7.9	4.1	20.4

Table 9.-- Canned halved Clingstone peaches: Average net weights, drained weights, and Brix, and count range by can size and country of origin

Can size and country of origin	Number of cans	Average weight		Average Brix	Count range
		Net	Drained		
#2-1/2:		*Ounces*	*Ounces*	*Degrees*	*Halves*
United States.....	31	29.8	17.9	22.0	7-10
South Africa.....	36	30.0	20.9	24.4	9-12
Australia	16	31.5	20.8	23.8	9-15
300 x 409:					
South Africa.....	36	16.9	11.0	24.6	7-12
Australia	6	16.4	10.4	18.8	5- 8
213 x 406:					
Argentina.....	6	13.8	9.7	18.2	6- 8
211 x 400:					
South Africa.....	6	8.4	5.3	23.5	4
300 x 507:					
Japan[1].....	6	15.1	9.7	20.8	4

[1] White Freestone Peaches

Table 10. — Canned fruit cocktail: Percent of cans meeting U. S. grades and percent failing U. S. Food and Drug standards by country of origin

Country of origin	Number of cans	Meeting U. S. Grades				Failing one or more U.S. Food & Drug requirements
		U. S. Grade A	U. S. Grade B	Sub-standard	Total	
		Percent	*Percent*	*Percent*	*Percent*	*Percent*
United States.....	103	85	15	0	100	23
Australia	65	40	51	9	100	91
South Africa	42	40	55	5	100	86
England.....	30	17	80	3	100	80

Table 11. — Canned fruit cocktail: Average Brix and score point for each factor of quality by country of origin

Country of origin	Number of cans	Average degrees Brix	Average score points					
			Liquor	Color	Size	Defects	Character	Total
U. S. grade A lots:								
United States...	85	18.3	17.7	19.1	17.8	18.7	18.8	92.1
South Africa....	6	22.9	19.2	18.7	16.7	19.0	18.3	91.8
Australia	24	22.1	17.2	17.7	16.9	17.5	18.3	87.5
England.....	6	17.0	19.0	15.7	19.0	17.5	19.0	90.2
U. S. grade B lots:								
United States...	18	20.8	17.0	17.9	16.2	16.9	16.3	84.4
South Africa....	30	23.3	17.9	17.2	17.6	17.5	8.0	88.2
Australia	36	20.9	17.7	15.7	16.2	17.2	16.5	83.4
England	25	19.3	17.4	14.4	15.2	16.8	16.9	80.1
Substandard lots:								
Australia	6	18.9	15.0	14.3	15.0	14.8	16.0	75.2
South Africa....	6	23.2	16.3	14.8	14.0	16.5	15.0	76.7

Table 12. — Canned fruit cocktail: Average Brix, net weight, and drained weight, and required U. S. drained weight, by can size and country of origin

Can size and country of origin	Number of cans	Average Brix	Average Weight		Required U. S. drained weight
			Net	Drained	
#2-1/2:		*Degrees*	*Ounces*	*Ounces*	*Ounces*
United States.....	30	17.5	30.0	20.2	19.3
South Africa	6	23.1	30.2	15.5	19.3
#303:					
United States.....	61	19.1	17.0	11.6	11.0
300 x 409:					
United States.....	6	20.9	17.3	11.1	9.9
South Africa.....	18	23.8	16.5	9.8	9.9
Australia	48	21.1	16.6	10.5	9.9
England.....	3	21.0	16.0	9.0	9.9
307 x 307:					
South Africa.....	12	22.6	16.8	11.9	9.9
Australia	12	22.7	16.6	11.2	9.9
300 x 407:					
South Africa.....	6	23.2	17.6	11.6	9.9
300 x 315:					
England.....	6	20.6	13.6	8.5	8.6
8Z Tall:					
United States.....	6	19.8	8.5	4.7	5.6
210 x 300:					
Australia	6	18.6	8.9	5.5	5.3
England.....	12	17.3	8.0	4.2	5.3

Table 13. -- Canned fruit cocktail: Weight of drained fruit, by type and country of origin

Country of origin	Weight of drained fruit														
	Peaches			Pears			Grapes			Pineapple[1]			Cherries		
	Low	High	Avg.	Low	High	Avg.	Low	High	Avg.	Low	High	Avg.	Low	High	Avg.
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
United States.....	35	52	41	21	44	32	7	21	15	6	16	9	1	8	3
South Africa.....	31	43	37	21	41	27	0	10	5	15	36	29	1	5	2
Australia	15	49	35	25	48	37	9	15	13	5	32	13	1	3	2
England[2].....	27	40	33	15	37	30	0	17	10	10	30	17	7	15	10

[1] Note comparatively large amounts of pineapple in South African fruit cocktail.

[2] Mandarin orange segments often used in English fruit cocktail not included.

Table 14. -- Canned pears: Percent meeting U. S. grades, by country of origin

Country of origin	Number of cans	U. S. Grade			Substandard	Total
		A	B	C		
		Percent of cans	*Percent of cans*	*Percent of cans*	*Percent of cans*	*Percent of cans*
Australia	109	1	79	20	0	100
Italy	24	0	79	21	0	100
South Africa.....	12	0	50	50	0	100
United States.....	6	100	0	0	0	100
Netherlands.....	6	0	0	0	100	100
Argentina.....	2	0	0	50	50	100

Table 15. -- Canned pears: Average Brix and score points for each factor of quality, by country of origin

Country of origin	Number of cans	Average degrees Brix	Average score points				
			Color	Size	Defects	Character	Total
U. S. grade A lots:							
United States....	6	24.3	19.3	20.0	27.5	28.7	95.7
U. S. grade B lots:							
South Africa.....	6	22.7	18.0	19.3	27.2	24.0	88.0
Australia.....	72	19.6	17.0	16.5	25.2	25.3	84.8
Italy.....	18	19.3	16.7	16.3	26.2	25.2	84.3
U.S. grade C lots:							
South Africa.....	6	22.5	15.5	17.2	29.0	26.8	86.6
Australia	37	17.2	16.1	15.7	25.3	24.4	81.7
Italy.....	6	18.4	16.7	17.5	26.3	24.0	84.5
Substandard lots:							
Netherlands.....	6	18.8	13.8	11.8	21.0	18.8	60.3

Table 16. – Canned pears: Average net weights, drained weights, Brix, and the count range by can size and country of origin

Can size and country of origin	Number of cans	Average weight		Average Brix	Count range
		Net	Drained		
#2-1/2:		*Ounces*	*Ounces*	*Degrees*	*Halves*
Australia	79	29.5	17.8	19.5	5-12
South Africa	6	29.3	17.6	22.7	6- 9
#303:					
United States	6	17.0	9.0	24.3	5
Italy	6	15.7	9.2	18.5	5- 7
300 x 409:					
Australia	30	16.3	9.6	19.0	4- 7
Italy	6	15.7	9.3	18.5	5- 6
307 x 307:					
South Africa	6	15.8	9.8	17.8	5- 7
314 x 412:					
Italy	6	29.0	18.5	18.6	7-19
215 x 407:					
Netherlands	6	16.0	10.9	19.8	7-10
213 x 406:					
Argentina	2	13.3	9.4	16.0	4- 7
211 x 400:					
Italy	6	11.3	5.8	20.3	4- 6

Table 17. – Canned apricots: Percent meeting U. S. grades by country of origin

Country of origin	Number of cans	U. S. Grade			Sub-standard	Total
		A	B	C		
		Percent of cans	*Percent of cans*	*Percent of cans*	*Percent of cans*	*Percent of cans*
South Africa	126	11	60	29	0	100
Australia	60	5	82	13	0	100
Spain	12	8	92	0	0	100
United States	12	100	0	0	0	100

Table 18.— Canned apricots: Average Brix and score points for each factor of quality, by country of origin

Country of origin	Number of cans	Average degrees Brix	Average score points				
			Color	Size	Defects	Character	Total
U. S. grade A lots:							
United States....	12	26.4	18.6	17.8	27.1	28.7	93.2
U. S. grade B lots:							
South Africa.....	78	24.7	16.8	17.9	27.6	25.7	88.1
Australia	42	23.3	16.6	17.5	26.2	25.2	85.5
U. S. grade C lots:							
South Africa.....	48	24.8	15.4	17.4	27.0	23.6	83.4
Australia	18	25.7	16.0	15.9	28.1	23.9	83.9
Spain.....	12	21.8	15.0	16.1	22.6	23.0	77.4

Table 19.— Canned apricots: Average net weights, drained weights and Brix, and count range by can size and country of origin

Can size and country of origin	Number of cans	Average weight		Average Brix	Count range
		Net	Drained		
#2-1/2:		*Ounces*	*Ounces*	*Degrees*	*Halves*
South Africa.....	72	39.2	17.9	27.8	17-38
Australia	30	30.9	18.2	22.6	20-41
#303:					
United States.....	12	17.9	10.1	26.3	10-11
300 x 409:					
South Africa.....	48	16.9	10.0	24.9	15-26
Australia	24	17.1	9.7	24.2	7-20
300 x 408:					
Spain.....	12	17.0	11.0	21.8	13-19
307 x 307:					
South Africa.....	6	16.6	10.8	23.6	21-30
8Z Tall:					
Australia	6	8.6	5.0	23.0	8-12

Table 20. -- Raisins: United States grades of lots examined, showing major shortcomings of product, by country of origin

Country of origin	Number of lots	U. S. Grades	Major reason for down grading
Australia	28	Substandard	Visible mold.
	1[1]	Substandard	Capstems.
	1[1]	Substandard	Sugaring.
Turkey	16	Substandard	Stems, capstems, and/or damage.
United States	7	U. S. Grade B	Maturity.
	1	U. S. Grade B	Maturity, capstems, damage.
	1	U. S. Grade B	Maturity and damage.
	1	U. S. Grade B	Maturity and stems.
	1	U. S. Grade B	Damage.
	5	U. S. Grade C	Maturity.
	1	U. S. Grade C	Damage.
	1	U. S. Grade C	Capstems.
	1	Substandard	Moisture.

[1] Lexias.

Table 21. -- Raisins: Moisture content, by country of origin, and U. S. 1960 crop comparison

Country of origin	Number of lots	Percent moisture content								
		U. S. Grades A - B - and C							Sub-standard	Total
		11.1 to 12.0	12.1 to 13.0	13.1 to 14.0	14.1 to 15.0	15.1 to 16.0	16.1 to 17.0	17.1 to 18.0	18.1 to 19.0	
		Percent of lots	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*
Australia	28	4	17	4	21	11	32	4	7	100
Turkey	16	0	0	0	0	6	69	25	0	100
United States ...	19	0	11	5	16	42	16	5	5	100
U. S. 1960 pack .	2,784	1	3	2	9	22	34	29	[1]	100

[1] Less than ½ of 1 percent.

Table 22. — Raisins: Number of capstems per pound, by country of origin, and U. S. 1960 crop comparison

Country of origin	Number of lots	Number of capstems per pound								
		U. S. Grade A			U. S. Grade B		U. S. Grade C		Sub-standard	Total
		0-5	6-10	11-15	16-20	21-25	26-30	31-35	36 plus	
		Percent of lots	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*
Australia	28	39	14	21	18	4	0	0	4	100
Turkey	16	0	6	0	6	20	6	0	62	100
United States	19	16	11	41	27	0	5	0	0	100
U. S. 1960 pack ..	2,782	18	38	21	13	5	3	2	[1]	100

[1] Less than ½ of 1 percent.

Table 23. — Raisins: Prevalence of damage specimens, by country of origin, and U. S. 1960 crop comparison

Country of origin	Number of lots	Percent damaged raisins by count							Total
		U. S. Grade A		U. S. Grade B	U. S. Grade C		Substandard		
		0 to 1.0	1.1 to 2.0	2.1 to 3.0	3.1 to 4.0	4.1 to 5.0	5.1 to 6.0	Over 6.0	
		Percent of lots	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*
Australia	28	22	54	14	10	0	0	0	100
Turkey	16	0	0	13	25	6	13	43	100
United States	19	21	42	32	5	0	0	0	100
U. S. 1960 pack	2,784	24	51	18	5	2	[1]	0	100

[1] Less than ½ of 1 percent.

Table 24. — Raisins: Prevalence of mold, by country of origin, and U. S. 1960 crop comparison

Country of origin	Number of lots	Percent of moldy raisins								
		U. S. Grade A		U. S. Grade B	U. S. Grade C	Substandard[1]				Total
		0 - 1	1.1 - 2.0	2.1 - 3.0	3.1 - 4.0	4.1 - 10.0	10.1 - 15.0	15.1 - 20.0	Over 20	
		Percent of lots	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*
Australia	28	0	0	0	0	43	46	7	4	100
Turkey	16	81	13	6	0	0	0	0	0	100
United States	19	95	5	0	0	0	0	0	0	100
U. S. 1960 pack ..	2,789	46	46	7	1	[2]	0	0	0	100

[1] Intervals above 4 percent moldy raisins are substantially increased.

[2] Less than ½ of 1 percent.

Table 25. — Raisins: Prevalence of sand, by country of origin, and U. S. 1960 crop comparison

Country of origin	Number of lots	Units of sand[1]							
		0 to 1.0	1.01 to 2.0	2.01 to 3.0	3.01 to 4.0	4.01 to 5.0	5.01 to 6.0	Over 6.0	Total
		Percent of lots	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*
Australia	28	25	25	13	16	13	4	4	100
Turkey	16	31	38	25	0	0	0	6	100
United States	19	74	21	0	5	0	0	0	100
U. S. 1960 pack	2,784	15	(79)		4	[2]	1	[2]	100

[1] An arbitrary measure of sand determined by an established laboratory procedure— see text.

[2] Less than ½ of 1 percent.

Table 26. — Raisins: Percentages of properly matured raisins in lots examined, by country of origin, and U. S. 1960 crop comparison

Country of origin	Number of lots	Percentage of properly matured raisins					
		U. S. Grade					Total
		A	B		C		
		Over 90	81 to 90	71 to 80	61 to 70	0 to 60	
		Percent of lots	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*	*Percent of lots*
Australia	28	54	39	7	0	0	100
Turkey.....	16	19	50	25	6	0	100
United States	19	5	21	48	21	5	100
U. S. 1960 pack	2,784	5	60	30	(5)		100

Table 27. — Dried prunes: Count per pound, moisture content, defects, and grade of individual lots, by country of origin

Country of origin	Count per lb.	Percent moisture content	Percent defects by weight							U. S. Grade
			Off-color	Poor texture	End cracks	Minor damage[1]	Serious damage[2]	Decay	Total	
United States ...	40	25.5				3.0			3.0	A[3]
	53	26.0			1.0	2.0			3.0	A[3]
	47	25.0				1.0			1.0	A[3]
	49	22.4			1.8	1.5	0.5		3.8	A[3]
	39	22.0				6.0			6.0	A
	59	23.2				2.5				A
	28	19.3	0.5	0.5		1.0			2.0	A[3]
	79	21.9			1.5	4.3			5.8	A[3]
	81	18.6		0.5	0.5	1.5	0.5		3.0	A[3]
	68	22.9		0.3	2.0	2.5			4.8	A
	36	24.6			0.5	3.5			4.0	A
	79	22.9			2.3	3.0			5.3	A
	51	26.5			2.5	4.0			6.5	B[3]
	88	26.6			2.0	2.0			4.0	B[3]
	86	20.3			2.5	1.5			4.0	B[3]
	54	25.8			3.5	2.5	2.5		9.0	C[3]
	33	23.4			3.5	8.5		0.5	12.5	SStd.
	49	24.4			2.0	6.5			8.5	SStd.[4]
Australia	61	22.3		1.5		4.7			6.2	A
	89	20.6		2.5		5.3			7.8	B
	66	22.5			4.3	3.5	3.1		10.9	SStd.
Chile	56	21.4			0.5	1.0	0.5		2.0	A
	68	21.1			0.5	12.0	2.9		15.4	SStd.
Argentina	68	22.6				3.0			3.0	A
	91	22.0		1.6	0.5	2.6	1.5		6.6	B
	68	22.3		0.5		19.0			19.5	SStd.
	96	21.9		0.8	0.5	8.0	3.0		12.3	SStd.

[1] Includes skin or flesh damage, fermentation scars, heat damage, insect injury, other minor injury.

[2] Includes mold, dirt, foreign material, insect infestation.

[3] Retail packages; all other lots were bulk packs.

[4] Account of uneven moisture.

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